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IMPLEMENTATION PLAN REVIEW FOR MAINE AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

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IMPLEMENTATION PLAN REVIEW

FOR

MAINE

AS REQUIRED

BY

THE ENERGY SUPPLY

AND

ENVIRONMENTAL COORDINATION ACT

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16. ABSTRACT

Section IV of the Energy Supply and Environmental Coordination Act of 1974, (ESECA) requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interferring with the attainment and maintenance of the national ambient air quality standards. This document, which is also required by Section IV of ESECA, is EPA's report to the State indicating where regulations might be revised.

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IMPLEMENTATION PLAN REVIEW

FOR

MAINE

AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

PREPARED BY THE FOLLOWING TASK FORCE:

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Research Triangle Park, North Carolina 27711

December 1974

MAINE

ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT
(SECTION IV - STATE IMPLEMENTATION PLAN REVIEW)

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1.0 EXECUTIVE SUMMARY

The enclosed report is the U.S. Environmental Protection Agency's (EPA) response to Section IV of the Energy Supply and Environmental Coordination Act of 1974 (ESECA). Section IV requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interfering with the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). In addition to requiring that EPA report to the State on whether control regulations might be revised, ESECA provides that EPA must approve or disapprove any revised regulations relating to fuel burning stationary sources within three months after they are submitted to EPA by the States. The States may, as in the Clean Air Act of 1970, initiate State Implementation Plan revisions; ESECA does not, however, require States to change any existing plan.

Congress has intended that this report provide the State with information on excessively restrictive control regulations. The intent of ESECA is that SIP's, wherever possible, be revised in the interest of conserving low sulfur fuels or converting sources which burn oil or natural gas to coal. EPA's objective in carrying out the SIP reviews, therefore, has been to try to establish if emissions from combustion sources may be increased. Where an indication can be found that emissions from certain fuel burning sources can be increased and still attain and maintain NAAQS, it may be plausible that fuel resource allocations can be altered for "clean fuel savings" in a manner consistent with both environmental and national energy needs.

In many respects, the ESECA SIP reviews parallel EPA's policy on clean fuels. The Clean Fuels Policy has consisted of reviewing implementation plans with regards to saving low sulfur fuels and, where the primary sulfur dioxide air quality standards were not exceeded, to encourage States to either defer compliance regulations or to revise the SO_2 emission regulations. The States have also been asked to discourage large scale shifts from coal to oil where this could be done without jeopardizing the attainment and maintenance of the NAAQS.

To date, EPA's fuels policy has addressed only those States with the largest clean fuels saving potential. Several of these States have or are currently in the process of revising SO_2 regulations. These States are generally in the Eastern half of the United States. ESECA, however, extends the analysis of potentially over-restrictive regulations to all 55 States and territories. In addition, the current reviews address the attainment and maintenance of all the National Ambient Air Quality Standards.

There are, in general, three predominant reasons for the existence of overly restrictive emission limitations within the State Implementation Plans. These are (1) The use of the example region approach in developing State-wide air quality control strategies; (2) the existence of State Air Quality Standards which are more stringent than NAAQS; and (3) the "hot spots" in only part of an Air Quality Control Region (AQCR) which have been used as the basis for controlling the entire region. Since each of these situations affect many State plans and in some instances conflict with current national energy concerns, a review of the State Implementation Plans is a logical follow-up to EPA's initial appraisal of the SIP's conducted in 1972. At that time SIP's were approved by EPA if they demonstrated the attainment of NAAQS or more stringent state air quality standards. Also, at that time an acceptable method for formulating control strategies was the use of an example region for demonstrating the attainment of the standards.

The example region concept permitted a State to identify the most polluted air quality control region (AQCR) and adopt control regulations which would be adequate to attain the NAAQS in that region. In using an example region, it was assumed that NAAQS would be attained in the other AQCR's of the State if the control regulations were applied to similar sources. The problem with the use of an example region is that it can result in excessive controls, especially in the utilization of clean fuels, for areas of the State where sources would not otherwise contribute to NAAQS violations. For instance, a control strategy based on a particular region or source can result in a regulation requiring 1 percent sulfur oil to be burned state-wide where the use of 3 percent sulfur coal would be adequate to attain NAAQS in some locations.

EPA anticipates that a number of States will use the review findings to assist them in making the decision whether or not to revise portions of their State Implementation Plans. However, it is most important for those States which desire to submit a revised plan to recognize the review's limitations. The findings of this report are by no means conclusive and are neither intended nor adequate to be the sole basis for SIP revisions; they do, however, represent EPA's best judgment and effort in complying with the ESECA requirements. The time and resources which EPA has had to prepare the reports has not permitted the consideration of growth, economics, and control strategy tradeoffs. Also, there have been only limited dispersion modeling data available by which to address individual point source emissions. Where the modeling data for specific sources were found, however, they were used in the analysis.

The data upon which the reports' findings are based are the most currently available to the Federal Government. However, EPA believes that the States possess the best information for developing revised plans. The States have the most up-to-date air quality and emissions data, a better feel for growth, and the fullest understanding for the complex problems facing them in the attainment and maintenance of air quality. Therefore, those States desiring to revise a plan are encouraged to verify and, in many instances, expand the modeling and monitoring data supporting EPA's findings. In developing a suitable plan, it is suggested that States select control strategies which place emissions for fuel combustion sources into perspective with all sources of emissions such as smelters or other industrial processes. States are encouraged to consider the overall impact which the potential relaxation of overly restrictive emissions regulations for combustion sources might have on their future control programs. This may include air quality maintenance, prevention of significant deterioration, increased TSP, NO_x, and HC emissions which occur in fuel switching, and other potential air pollution situations such as sulfates.

Although the enclosed analysis has attempted to address the attainment of all the NAAQS, most of the review has focused on total suspended particulate matter (TSP) and sulfur dioxide (SO_2) emissions. This is because stationary fuel combustion sources constitute the greatest source of SO_2 emission and are a major source of TSP emissions.

Part of each State's review was organized to provide an analysis of the SO_2 and TSP emission tolerance within each of the various AQCR's. The regional emission tolerance estimate is, in many cases, EPA's only measure of the "over-cleaning" accomplished by a SIP. The tolerance assessments have been combined in Section 2 and Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for changing emission limitation regulations. In conjunction with the regional analysis, a summary of the State's fuel combustion sources (power plants, industrial sources, and area sources) has been carried out in Appendices C, D, and E.

The State Implementation Plan for the State of Maine has been reviewed for the most prevalent causes of over-restrictive fuel combustion, emission limiting, regulations. The major findings of the review are:

FOR SO_2, THERE ARE TWO AQCR's, ANDROSCOGGIN VALLEY AND DOWN EAST WHICH INDICATE SOME POTENTIAL FOR REVISION OF FUEL COMBUSTION SOURCE EMISSION LIMITING REGULATIONS.

FOR TOTAL SUSPENDED PARTICULATES, THERE IS ONLY ONE AQCR, METROPOLITAN PORTLAND, WHICH INDICATES ANY POTENTIAL FOR REVISING FUEL COMBUSTION SOURCE EMISSION LIMITING REGULATIONS. HOWEVER, THIS POTENTIAL IS LIMITED DUE TO THE RELATIVELY LOW VOLUME OF FUEL BURNED IN THE REGION.

The supportive findings of the SIP review are as follows:

Maine currently uses very little coal for fuel combustion. Almost all fuel combustion in the State uses fuel oil. In most cases the use of low sulfur coal and existing emission control technology would be more consistent with national energy policies.

Considerably more data are needed concerning the air quality in Maine, particularly in the Aroostook and Northwest Maine AQCR's. It is highly possible that additional clean fuel savings could be realized in these regions if more were known about their air quality status.

2.0 STATE IMPLEMENTATION PLAN REVIEW

2.1 SUMMARY

A revision of fuel combustion source emissions regulations will depend on many factors. For example:

- Does the State have air quality standards which are more stringent than NAAQS?
- Does the State have emission limitation regulations for control of (1) power plants, (2) industrial sources, (3) area sources?
- Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?
- Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?
- Are there no proposed Air Quality Maintenance Areas?
- Are there indications of a sufficient number of monitoring sites within a region?
- Is there an expected 1975 attainment data for NAAQS?
- Based on (1973) air quality data, are there no reported violations of NAAQS?
- Based on (1973) air quality data, are there indications of a tolerance for increasing emissions?
- Are the total emissions from stationary fuel combustion sources proportionally lower than those of other sources?
- Is there a significant clean fuels savings potential in the region?
- Do modeling results for specific fuel combustion sources show a potential for a regulation revision?

The following portion of this report is directed at answering these questions. An AQCR's potential for revising regulations increases when there are affirmative responses to the above.

The initial part of the SIP review report, Section 2 and Appendix A, was organized to provide the background and current situation information for the State Implementation Plan. Section 3 and the remaining Appendices

provide an AQCR analysis which helps establish the overall potential for revising regulations. Emission tolerance estimates have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for revising emission limiting regulations. In conjunction with the regional analysis, a characterization of the State's fuel combustion sources (power plants, industrial sources, and area sources) has been carried out in Appendices C, D, E.

Based on an overall evaluation of EPA's current information, AQCR's have been classified as good, marginal, or poor candidates for regulation revisions. Table 2-1 summarizes the State Implementation Plan Review. The remaining portion of the report supports this summary with explanations.

2.2 AIR QUALITY SETTING--STATE OF MAINE

The State of Maine is divided into five AQCR's. These are AQCR 107, Androscoggin Valley Interstate (Maine and New Hampshire); AQCR 108, Aroostook Intrastate; AQCR 109, Down East Intrastate; AQCR 110, Metropolitan Portland Intrastate; and AQCR 111, Northwest Maine Intrastate (Figure 2-1).

A summary of the Federal and Maine air quality standards for particulates, SO_2, and NO_2 is presented in Table A-3. It should be noted that the standards adopted by Maine are more stringent than the respective Federal standards in all cases except NO_2 where they are identical.

Air quality monitoring in Maine is limited, particularly in AQCR's 108 and 111 where there is no monitoring. There are only six continuous SO_2 monitors in the entire state, one each in Augusta and Lewiston (AQCR 107), two in Bangor (AQCR 109), and two in Portland (AQCR 110). There are 21 additional stations in the state with both particulate and SO_2 24-hour bubbler monitors. These, however, are distributed throughout only three of the five regions: 107, 109, and 110. One additional particulate monitoring station is located in Portland (AQCR 110).

A summary of Maine Air Quality Status is presented in Tables A-4 and A-5. The number of stations exceeding the standards are presented by AQCR. It is significant to note from the tables that during 1973, there were no violations of any particulate standards within the State of Maine. All

TABLE 2-1

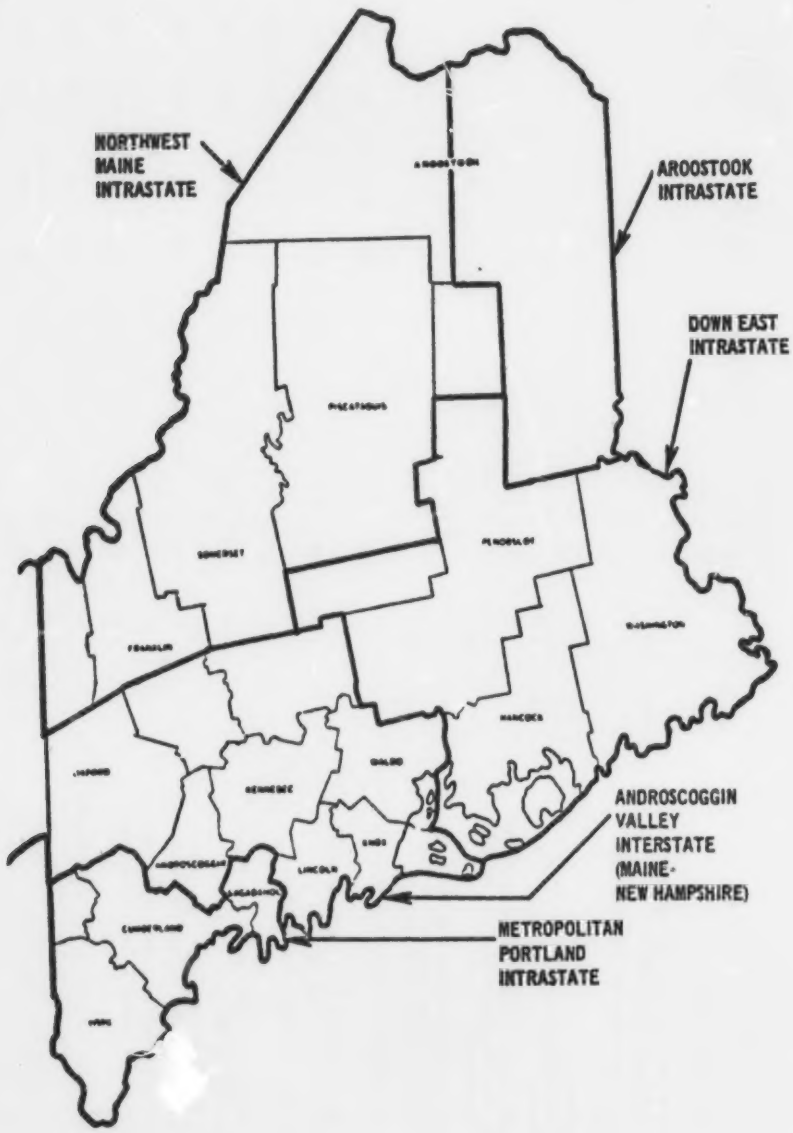
STATE IMPLEMENTATION PLAN REVIEW
(SUMMARY)

"Indicators"	Maine		Androscoggin Valley AQCR 107		Aroostook AQCR 108		Down East AQCR 109		Metropolitan Portland AQCR 110		Northwest Maine AQCR 111	
	TSP	SO_2	TSP	SO_2	TSP	SO_2	TSP	SO_2	TSP	SO_2	TSP	SO_2
• Does the State have air quality standards which are more stringent than NAAQS?	Yes	Yes										
• Does the State have emission limiting regulations for control of:												
1. Power plants	Yes	Yes										
2. Industrial sources	Yes	Yes										
3. Area sources	No	Yes										
• Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?	Yes	Yes										
• Has the State <u>not</u> initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?	Yes	Yes										
• Are there <u>no</u> proposed Air Quality Maintenance Areas?			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• Are there indications of a sufficient number of monitoring sites within a region?			Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No
• Is there an expected 1975 attainment data for NAAQS?			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• Based on (1973) Air Quality Data, are there no reported violations of NAAQS?			Yes[1]	Yes	NA	NA	Yes	Yes	Yes	No	NA	NA
• Based on (1973) Air Quality Data, are there indications of a tolerance for increasing emissions?			No	Yes	NA	NA	No[2]	Yes	Yes	No	NA	NA
• Are the total emissions from stationary fuel combustion sources proportionally lower than those of other sources?			Yes	No	Yes	No	Yes	No	Yes	No	No	No
• Do modeling results for fuel combustion sources show a potential for a regulation revision?			NA	No	NA	NA	NA	NA	NA	NA	NA	NA
• Must emission limiting regulations be revised to accomodate significant fuel switching?			No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
• Based on the above indicators, what is the potential for revising fuel combustion source emission limiting regulations?			Poor	Good	Marg.	Marg.	Marg.	Good	Good	Poor	Marg.	Marg.
• Is there a significant Clean Fuels Saving potential in the region?			No		No		No		No		No	

[1] There were violations in the New Hampshire Portion of the region.

[2] But a significant amount

Figure 2-1 MAINE AIR QUALITY CONTROL REGION



particulate violations in AQCR 107 occurred in New Hampshire. Only one violation of an SO_2 standard (annual) occurred in Maine. That violation, at a site in Portland, only exceeded the standard by less than seven percent.

A summary of significant Maine emission sources is presented in Table A-6. The table shows the number of sources by type and AQCR, as well as the total particulate and SO_2 emissions. The percentage of the total emissions contributed by Maine fuel combustion sources is also shown. Tables A-7 and A-8 follow from Table A-6 by giving a more detailed analysis of existing emissions[1]. It is interesting to note that the Maine portion of AQCR 107 contributes by far the greatest quantity of emissions, while the highest air quality measurements occur in the more highly populated Metropolitan Portland AQCR (110).

In general, Maine's air pollution tends to be concentrated in the southern and south-central portion of the state. A high percentage of SO_2 emissions are accounted for by fuel combustion sources, while about two-thirds of the particulate emissions can be attributed equally to fuel combustion, and the wood products industry.

2.3 BACKGROUND ON THE DEVELOPMENT OF THE CURRENT STATE IMPLEMENTATION PLAN

The SIP control strategies and regulations were based on the example region approach. Example regions are used when ambient air quality data is available for one but not all of several air quality control regions that have similar emissions. The strategies and regulations thus developed are then applied to the similar regions as well as the example region.

The Metropolitan Portland AQCR was used as the example region for the entire state for particulate matter. The City of Augusta was selected as the example region for SO_2 in the Androscoggin Valley and Down East AQCR's. This region was selected because ambient air quality data were available and this region contains a sulfite pulp mill, a primary source of sulfur dioxide.

The Metropolitan Portland AQCR was considered separately for SO_2 control

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[1] All emissions data taken from NEDS.

since this region has no single large source of sulfur dioxide.

The regulation adopted for the control of particulate matter from fuel combustion sources is based on the rated capacity of the fuel burning equipment. The regulation is applicable to all fuel burning equipment in the state with a rated capacity greater than three million BTU per hour, and is displayed graphically in Figure A-1.

A sulfur content limitation is used to control sulfur dioxide emissions from fuel combustion sources in Maine. Sources in the Metropolitan Portland AQCR are limited to a maximum of 1.5 percent sulfur in all fuels burned; the maximum is 2.5 percent for sources in the other four regions.

Maine has no regulations for the control of NO_2.

3.0 AQCR ASSESSMENTS BASED ON SIP REVIEWS

The purpose of this section is to evaluate the available information for the State of Maine and determine the feasibility of revisions to the SIP which would result in clean fuel conservation. The assessments will be made by AQCR addressing each type of fuel combustion source: power plants, large industrial and commercial/institutional sources, and area sources. The assessments must be made for each pollutant separately and are made on the basis of seven criteria: (1) 1973 air quality violations; (2) expected NAAQS attainment dates; (3) proposed Air Quality Maintenance Area (AQMA) designations; (4) total emissions; (5) portion of emissions from Maine fuel combustion sources; (6) regional tolerance for emissions increase; and (7) pollutant priority classifications. Tables B-1 and B-2 tabulate these criteria for each AQCR for TSP and SO_2, respectively.

The AQCR's are grouped into good, marginal, and poor candidates for regulation relaxation based on the evaluation of all the presented information. Using available data, any AQCR which displays a 1973 air quality violation would probably be given a poor ranking. Conversely, a region with no violations, no proposed AQMA designations, low to moderate emissions, a positive emission tolerance, and/or a small fraction of emissions from Maine fuel combustion sources would receive a good ranking. All other regions with varying indicators or incomplete or missing data would be evaluated separately and grouped in the appropriate class, most likely a marginal ranking.

The source type groups are evaluated separately using such variables for criteria as modeling results, emissions data from the SIP and/or NEDS, and air quality data.

3.1 ANDROSCOGGIN VALLEY INTERSTATE AQCR 107

3.1.1 Regional Air Quality Assessment

The Androscoggin Valley AQCR is ranked as a poor candidate for modification of particulate regulations for several reasons. Primary among these is the fact that there were high levels of TSP reported in 1973. Most high

levels occurred in the New Hampshire portion of the region. Since the original basis used by EPA in establishing the AQCR's was that air quality at any point in a region is affected only by sources in the region, Maine's sources may be having an adverse effect on the air quality levels in New Hampshire. Therefore, further analysis is required. If and only if it can be proven that New Hampshire's air quality is independent of Maine's sources, then this region would probably have the potential for regulation modification. Other negative factors include the relatively large total regional emissions, and a negative tolerance for emissions increase.

This AQCR is ranked as a good candidate for modification of SO_2 regulations mainly because of its high tolerance for SO_2 emissions increase based on 1973 air quality data. Other influencing factors are: no proposed AQMA designations and a relatively low percentage of emissions due to fuel combustion.

3.1.2 Power Plant Assessment

There are three electric generation facilities in the region. One is a residual oil burning gas turbine in New Hampshire. One is a distillate oil-fired gas turbine located at Farmingdale, Maine, and used only for emergency peaking use. The third plant is a 147 megawatt residual oil fired steam generating plant located at Wiscasset, Maine.

The plant at Wiscasset, Central Maine Power Company's Mason Plant, is currently burning 2.2 percent sulfur oil. Even though the Maine air pollution control regulations allow this plant to burn 2.5 percent sulfur fuel, modeling results indicate that maximum ground level concentrations of SO_2 may exceed the air quality standards if units three and four switch to 2.5 percent sulfur fuel. The following table shows these results.

Table 3-1. Mason Plant Modeling Results ($\mu g/m^3$)[a]

	Maximum 24-hr Concentration		Maximum Annual Concentration	
	TSP	SO_2	TSP	SO_2
Nominal Load	172	768	48	8
Maximum Load	175	924		

[a] Modeling Analysis of Power Plants for Fuel Conversion (Group IV), Walden Research Division of Abcor Inc., Sept. 12,1974

Since the Mason Plant burns oil, the Maine particulate regulation allows it a large increase in particulate emissions. However, air quality measurements (as discussed in the regional assessment, Section 3.1.1) prohibit any increase in particulate emissions.

3.1.3 Industrial and Commercial/Institutional Source Assessment

There are 14 significant fuel combustion particulate sources, and six SO_2 sources in this category. They contribute one tenth of the Maine portion of the particulate emissions, and one half of the SO_2. Existing regulations allow an increase in both particulate and SO_2 emissions, but again the air quality data indicate that this would only be reasonable in the case of SO_2. No modeling results are available for sources of this type, and therefore no statement can be made concerning the maximum sulfur content which would be acceptable without exceeding the standards.

3.1.4 Area Source Assessment

In this region, Maine fuel combustion area sources contribute about five percent of the particulate emissions and about 20 percent of the SO_2 emissions from sources in Maine. As explained in Section 3.1.1, the air quality prohibits any increase in particulate emissions in this region. There is, however, some room for an increase in SO_2 emissions, but without detailed area source data and modeling results, it is impossible at this time to make a final assessment of the regulation modification potential for area sources.

3.2 AROOSTOOK INTRASTATE AQCR 108

3.2.1 Regional Air Quality Assessment

This region received a marginal rating for both particulate and SO_2 regulation modification. This rating was based on the fact that there are no air quality monitors located in the region, and therefore it is impossible to evaluate the impact of any fuel switching plan. The region is classified Priority 3 for both pollutants and has no proposed AQMA designations, both indicative of a good regulation modification candidate. Total emissions are also low for both pollutants but fuel combustion sources contribute a relatively high percentage of the emissions, particularly for SO_2. For these reasons, the region appears qualitatively to be a very good candidate; however, some air quality data must be obtained before a quantitative judgment can be reached.

3.2.2 Power Plant Assessment

There is one small (19 megawatt) power plant located in AQCR 108. This is an oil burning steam generation plant currently burning 2.27 percent sulfur residual oil. Switching the fuel at this plant to the maximum allowable (2.5 percent) sulfur content would increase the SO_2 emissions by approximately 10 percent, but the impact on air quality cannot be estimated due to the lack of any air quality monitoring data. There is an allowable increase in particulate emissions, but again the impact of this change cannot be evaluated without air quality data.

3.2.3 Industrial and Commercial/Institutional Source Assessment

About one sixth of the particulate emissions and almost one half of the SO_2 emissions in AQCR 108 can be attributed to significant sources in this category. Existing Maine fuel combustion regulations allow an increase in both particulate and SO_2 emissions from industrial and commercial/institutional sources. It would be unwise, however, to state without qualification, that the regulations could be modified until air quality data and modeling results are available for analysis.

3.2.4 Area Source Assessment

Area sources in this region account for one fifth and one third of the particulate and SO_2 emissions, respectively. Without detailed area source fuel parameter information, it is impossible to estimate the impact of compliance with existing regulations. Even if this data were available, the advisability of regulation modification cannot be assessed without air quality data.

3.3 DOWN EAST AQCR 109

3.3.1 Regional Air Quality Assessment

AQCR 108 was given a marginal rating for particulate and a good rating for SO_2 regulation modification. Even though there were no 1973 violations of the particulate standards, no proposed particulate AQMA designations, and only moderate particulate total emissions, the tolerance for emissions increase is very small and, therefore, it was felt that this region was only a marginal candidate for particulate regulation modification. There were no violations of the SO_2 standards in 1973, no proposed SO_2 AQMA designations, moderate total emissions, and a high tolerance for SO_2 emissions increase. Therefore, this region was rated as a good candidate for SO_2 regulation modification in spite of its somewhat higher than average contribution of total emissions from fuel combustion sources.

3.3.2 Power Plant Assessment

One 57.5 megawatt power plant is located in AQCR 109. The plant burns 2.28 percent sulfur residual oil in five boilers, and 0.05 percent sulfur distillate oil in a gas turbine. Maine air pollution control regulations allow an increase in both particulate and SO_2 emissions from this plant. No modeling data is available for the plant, and, therefore, it is very difficult to evaluate the impact of increased emissions on the local air quality. It is recommended that modeling be accomplished and the results analyzed prior to any decision to increase emissions from this plant. As was discussed in the air quality assessment for this region, the tolerance (based on 1973 air quality data) for increased particulate emissions is very small, but it may be possible, due to the plant's location and prevailing meteorology, that increased emissions will not affect an already critical area.

3.3.3 Industrial and Commercial/Institutional Source Assessment

Significant sources in this category contribute about one third of the region's particulate emissions and almost three quarters of the SO_2 emissions. They are similar to the power plant discussed above in that compliance with existing regulations would result in increased particulate and SO_2 emissions. These sources are also similar to the power plant in that modeling is required before any definite policy of increased emissions can be formulated.

3.3.4 Area Source Assessment

The area source contribution is about ten percent of both the particulate and SO_2 total. No assessment of the feasibility of regulation modification can be made at this time due to a lack of detailed area source data.

3.4 METROPOLITAN PORTLAND INTRASTATE AQCR 110

3.4.1 Regional Air Quality Assessment

The Metropolitan Portland AQCR is ranked as a good candidate for modification of the particulate regulations and a poor candidate for SO_2. The particulate ranking is based on no 1973 air quality standard violations, no proposed AQMA designations, moderate total emissions, a low ratio of fuel combustion emissions to total emissions, and a relatively high tolerance for emission increase. The only negative aspect of the particulate assessment is the Priority 1 classification, but this is overshadowed by the fact that there were no reported air quality violations in 1973. There is an SO_2 problem in this region. Because of this, the existing state regulations are more stringent on sources located in this region; imposing a maximum sulfur content limitation of 1.5 percent as opposed to 2.5 percent for the remainder of the state. In this study, AQCR 110 is rated as a poor SO_2 candidate for three primary reasons: (1) an air quality violation during 1973; (2) a high contribution of SO_2 emissions from fuel combustion; and (3) a negative tolerance for increased SO_2 emissions.

3.4.2 Power Plant Assessment

There are two power plants in this region, the Cape Plant and the Wyman Plant, both operated by Central Maine Power Co. The Cape Plant is

a 22.5 megawatt oil fired plant, burning 2.2 percent sulfur residual oil (there are also two oil fired gas turbines at the plant). The plant is currently exceeding the maximum of 1.5 percent sulfur fuel, a reduction to which would lower SO_2 emissions by over 1000 tons per year. Strict compliance with the particulate regulation would increase the Cape Plant's particulate emissions by almost 500 tons per year.

The Wyman Plant is a much larger plant with a generating capacity of 214 megawatts. It burns 2.17 percent sulfur residual oil, with the capability of burning coal. Changing this plant to the maximum allowable sulfur content of 1.5 percent would decrease SO_2 emissions by over 5000 tons per year. The Wyman Plant can increase its particulate emissions by over 2000 tons per year and still be within the Maine particulate regulations.

3.4.3 Industrial and Commercial/Institutional Sources

A comparison of the emissions from the significant sources in this category with the emissions allowed by the regulations indicate that there would be a negligible reduction in particulate emissions (no significant particulate sources) and a large reduction in SO_2 emissions. With no modeling results, it is again impossible to ascertain whether or not strict compliance with existing regulations is necessary to prevent violation of the standards. It may be true for these sources as well as for the power plants that the SO_2 regulation could be modified and the resultant air quality still meet the standards assuming every source complied with the less stringent regulation. But this possibility can only be explored by a thorough analysis of air quality data, modeling results, and the interactions between plants influencing the air quality in critical areas.

3.4.4 Area Source Assessment

Area sources in this region contribute about one tenth of the regional particulate emissions and almost one third of the SO_2. Sufficient area source data are not available to make a complete analysis of the potential for regulation modification from this category of sources.

3.5 NORTHWEST MAINE INTRASTATE AQCR 111

3.5.1 Regional Air Quality Assessment

The Northwest Maine AQCR was given a marginal rating for both particulate and SO_2 due primarily to the fact that no air quality data is available. All criteria indicate qualitatively that the region would be an excellent candidate for both particulate and SO_2 regulation modification. The region is classified Priority 3 for both pollutants; no AQMA's are proposed for either pollutant; total emissions are both extremely low; and the fuel combustion contribution of both pollutants to the total is moderate. However, without the benefit of air quality data, a quantitative assessment is impossible at this time.

3.5.2 Power Plant Assessment

There are no power plants in this AQCR.

3.5.3 Industrial and Commercial/Institutional Source Assessment

Emissions from significant sources in this category comprise almost two thirds of the regional particulate and SO_2 emissions. Enforcement of the existing regulations would produce reduction in particulate emissions, but no reduction in SO_2. The latter is due to the fact that all significant industrial and commercial/institutional emissions are from the combustion of wood and bark. Again, no detailed assessment of the regulation modification potential can be made at this time due to the lack of air quality data.

3.5.4 Area Source Assessment

Area source emissions in this region are unavailable for both particulates and SO_2.

APPENDIX A

State Implementation Plan Background

TABLE A-1
MAINE AQCR PRIORITY CLASSIFICATION AND AQMA'S

AQCR Name	Fed #	AQCR Priority Classification			Population 1975	Proposed AQMA Designations	
		Part[a]	SO_x[a]	NO_x[a]		TSP Counties	SO_x Counties
Androscoggin Valley[b]	107	1	1	3	358,000	0	0
Aroostook	108	3	3	3	96,400	0	0
Down East	109	1	1	3	200,500	0	0
Metro. Portland	110	1	2	3	359,200	0	0
Northwest Maine	111	3	3	3	84,800	0	0

[a]Criteria based on maximum measured (or estimated) pollution concentration in area:

Priority	1	2	3
	Greater than	From - To	Less than
Sulfur oxide:			
Annual arithmetic mean	100	60 - 100	60
24 - hour maximum	455	260 - 455	260
Particulate matter:			
Annual geometric mean	95	60 - 95	60
24 - hour maximum	325	150 - 325	150

[b]Interstate region

TABLE A-2 ATTAINMENT DATES

AQCR #	Name	Particulate Attainment Dates		Sulfur Dioxide Attainment Dates	
		Primary	Secondary	Primary	Secondary
107	Androscoggin Valley[b]	7/75	7/75	7/75	7/75
108	Aroostook	(a)	(a)	(a)	(a)
109	Down East	7/75	7/75	7/75	7/75
110	Metropolitan Portland	7/75	7/75	7/75	7/75
111	Northwest Maine	(a)	(a)	(a)	(a)

a Air quality levels presently below standards

b Interstate region

TABLE A-3 AMBIENT AIR QUALITY STANDARDS

($\mu g/m^3$)

		Total Suspended Particulate		Sulfur Oxides			Nitrogen Oxides
		Annual	24 hr	Annual	24 hr	3 hr	Annual
Federal	Primary	75(1)	260(2)	80(3)	365(2)		100(3)
	Secondary	60(1)	150(2)			1300(2)	100(3)
Maine	Primary	50(1)	100				100(3)
	Secondary			57(3)	230	1150	100(3)

(1) Annual Geometric Mean

(2) Maximum concentration not to be exceeded more than once a year

(3) Annual Arithmetic Mean

TABLE A-4. MAINE AQCR AIR QUALITY STATUS (1973), TSP[a]

Name	AQCR #	# Stations Reporting	TSP Concentration ($\mu g/m^3$) Highest Reading Annual	Highest Reading 24-Hr	2nd Highest Reading 24-Hr	# Stations Violating Federal Ambient Air Quality Standards Primary Annual	Primary 24-Hr[c]	Secondary Annual	Secondary %	Secondary 24-Hr[c]	Secondary %	% Reduction Required to Meet Standards[d]	Standard on Which Reduction Is Based
Androscoggin Valley[b,e]	107	13	83	291	231	1	0	1	8	3	23	+39	Annual
Aroostook	108	0	-	-	-	0	0	0	0	0	0	-	-
Down East	109	8	NA	150	138	NA	0	NA	-	0	0	-11	24-hour
Metropolitan Portland	110	9	43	185	99	0	0	0	0	0	0	-69	24-hour
Northwest Maine	111	0	-	-	-	0	0	0	0	0	0	-	-

a 1973 air quality data in National Air Data Bank as of June 7, 1974.

b Interstate region.

c Violations based on 2nd highest reading at any station.

d Formula:

$$\frac{(\text{2nd Highest 24-hr} - \text{24-hr Secondary Standard})}{\text{2nd Highest 24-hr} - \text{Background}} \times 100$$

or:

$$\frac{(\text{Annual} - \text{Annual Secondary Standard})}{\text{Annual} - \text{Background}} \times 100$$

whichever is most stringent.

e All noted values occurred in New Hampshire.

NA Not available.

TABLE A-5. MAINE AQCR AIR QUALITY STATUS (1973), SO_2[a]

Name	AQCR #	# Stations Reporting 24-Hr (Bubbler)	# Stations Reporting (Contin.)	SO_2 CONCENTRATION ($\mu g/m^3$) Highest Reading Annual	Reading 24-Hr	2nd Highest Reading 24-Hr	# Stations Violating Ambient Air Quality Stds. Primary Annual	Primary 24-Hr[c]	Secondary 3-Hr	% Reduction[d] Required To Meet Standards	Standard on Which % Reduction Is Based
Androscoggin Valley[b]	107	8	3	NA	173	66	NA	0	NA	-453	24-Hr
Aroostook	108	0	0	-	-	-	0	0	0	-	-
Down East	109	8	2	NA	82	74	NA	0	NA	-393	24-Hr
Metropolitan Portland	110	8	2	85	391	96	1	0	NA	+ 6	Annual
Northwest Maine	111	0	0	-	-	-	0	0	0	-	-

a 1973 air quality data in National Air Data Bank as of July 29, 1974.

b Interstate region.

c Violations based on 2nd highest reading at any station.

d Formula: $\frac{(\text{2nd Highest 24-hr} - \text{24-hr Standard})}{\text{2nd highest 24-hr}} \times 100$

or: $\frac{(\text{Annual} - \text{Annual Standard})}{\text{Annual}} \times 100$

whichever is most stringent.

NA Not available

TABLE A-6
MAINE FUEL COMBUSTION SOURCE SUMMARY

AQCR NAME	AQCR No.	Power Plants[a]	Other Fuel Combustion Point Sources[b] TSP	Other Fuel Combustion Point Sources[b] SO_2	Area Sources[c]	Total Emissions (10^3 Tons/Year)[d] TSP	Total Emissions (10^3 Tons/Year)[d] SO_2	%Emissions From Maine Fuel Combustion Sources TSP	%Emissions From Maine Fuel Combustion Sources SO_2
Androscoggin Valley[e]	107	2	14[g]	6[g]	8	30.0	68.6	18	69
Aroostook	108	1	4[f]	3[f]	1	2.6	7.2	34	96
Down East	109	1	6[g]	8[g]	4	12.1	49.0	41	92
Metropolitan Portland	110	2	0[g]	5[g]	8	11.8	47.1	21	97
Northwest Maine	111	0	2[f]	2[f]	6	0.2	0.01	66	62

a - Maine power plants only
b - Maine plants in addition to power plants
c - Full counties, partial counties and towns, Maine only
d - AQCR total
e - Interstate region
f - All significant point sources, when combined with power plants, contribute at least 90% of the total emissions from fuel combustion point sources
g - All significant point sources, when combined with power plants, contribute less than 90% of the total emissions from fuel combustion point sources

TABLE A-7
MAINE EMISSIONS SUMMARY, TSP

AQCR Name	AQCR No.	Total Tons/Year	Percent Fuel Combustion	Electricity Generation Point Sources Tons/Year	Electricity Generation Point Sources %[b]	Other Point Source Fuel Combustion Tons/Year	Other Point Source Fuel Combustion %[b]	Area Source Fuel Combustion Tons/Year	Area Source Fuel Combustion %[b]
Androscoggin Valley	107	29,979	20	645	2	3536	12	1,853	6
Maine Portion		27,464	20[a]	459	2[a]	3349	12[a]	1,708	6[a]
N.H. Portion		2,515	21[a]	186	7[a]	187	7[a]	145	6[a]
Aroostook	108	2,560	34	32	1	349	14	478	19
Down East	109	12,128	41	98	1	3778	31	1,057	9
Metropolitan Portland	110	11,796	21	139	1	927	8	1,388	12
Northwest Maine	111	235	66	0	0	155	66	0	0

a - Percentage based only on the portion within the indicated state
b - Percentage of total emissions

TABLE A-8
MAINE EMISSIONS SUMMARY, SO_2

AQCR Name	AQCR No.	Total Tons/Year	Percent Fuel Combustion	Electricity Generation Point Sources Tons/Year	% [b]	Other Point Source Fuel Combustion Tons/Year	% [b]	Area Source Fuel Combustion Tons/Year	% [b]
Androscoggin Valley	107	68,618	85	18,997	28	29,191	43	10,430	15
Maine Portion		56,413	84[a]	10,966	19[a]	26,660	47[a]	9,517	17[a]
N.H. Portion		12,205	94[a]	8,031	66[a]	2,531	21[a]	913	7[a]
Aroostook	108	7,200	96	1,438	20	3,159	44	2,326	32
Down East	109	48,986	92	4,385	9	36,113	74	4,791	10
Metropolitan Portland	110	47,099	97	20,672	44	11,376	24	13,616	29
Northwest Maine	111	13	62	0	0	8	62	0	0

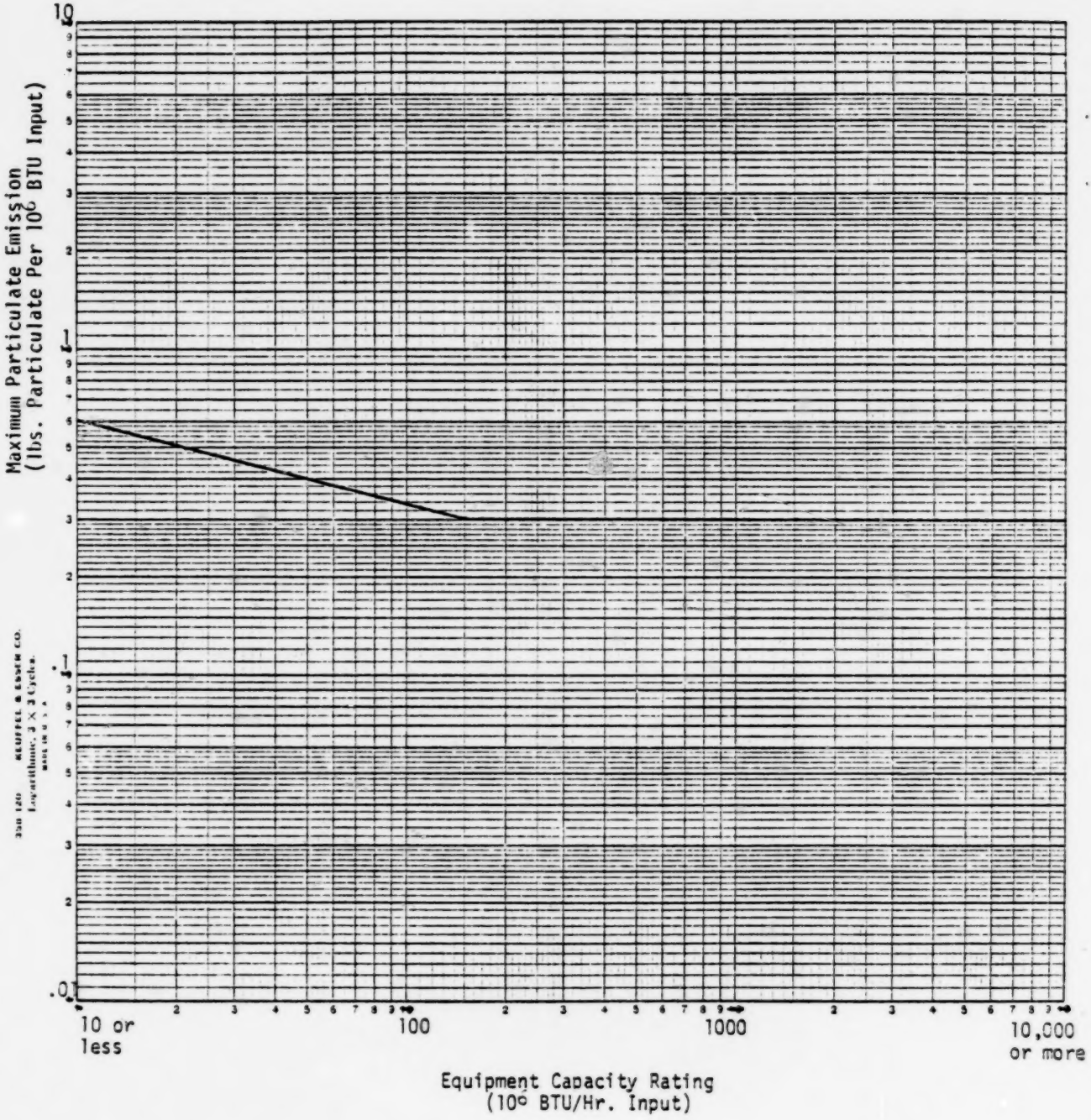
a - Percentage based only on the portion within the indicated state.
b - Percentage of total emissions

TABLE A-9
MAINE FUEL COMBUSTION EMISSION REGULATIONS[a]

Region Name	Region No.	Particulates	SO_x
Androscoggin Valley Aroostook Down East Northwest Maine	107 108 109 111	Fig. A-1 for all fuel-burning equipment that is fired at a range of 3 million BTU per hour or greater regardless of fuel type	Maximum sulfur content of any fuel is 2.5%
Metropolitan Portland	110	Fig. A-1 for all fuel-burning equipment that is fired at a range of 3 million BTU per hour or greater regardless of fuel type	Maximum sulfur contect of any fuel is 1.5%

a From Maine Air Pollution Control Laws as amended by Public Laws of 1971, 1972 and 1973

Figure A-1 MAINE PARTICULATE ALLOWABLE EMISSIONS



APPENDIX B

Regional Air Quality Assessment

TABLE B-1
REGIONAL INDICATORS FOR REVISION OF TSP REGULATIONS

AQCR Name	AQCR No.	No. of Stations Reporting	No. of Stations Violating Standards	Expected Attainment Date	Any Proposed AQMA Designations?	Total Emissions (10^3Tons/Year)	% Emission from Maine Fuel Combustion	Tolerance for Emissions Increase (10^3Tons/Year)
Androscoggin Valley[a]	107	13	3	7/75	No	30.0	18	-11.7
Aroostook	108	0	0	b	No	2.6	34	-
Down East	109	8	0	7/75	No	12.1	41	+1.3
Metropolitan Portland	110	9	0	7/75	No	11.8	21	+8.1
Northwest Maine	111	0	0	b	No	0.2	66	-

a Interstate region
b Air quality levels presently below standards

TABLE B-2
REGIONAL INDICATORS FOR REVISION OF SO_2 REGULATIONS

AQCR Name	AQCR No.	No. of Stations Reporting	No. of Stations Violating Standards	Expected Attainment Date	Any Proposed AQMA Designations?	Total Emissions (10^3Tons/Year)	% Emission from Maine Fuel Combustion	Tolerance for Emissions Increase (10^3Tons/Year
Androscoggin Valley[a]	107	8	0	7/75	No	68.6	69	+310.8
Aroostook	108	0	0	b	No	7.2	96	-
Down East	109	8	0	7/75	No	49.0	92	+192.6
Metropolitan Portland	110	8	1	7/75	No	47.1	97	-2.8
Northwest Maine	111	0	0	b	No	0.01	62	-

a Interstate region
b Air quality levels presently below standards

APPENDIX C

Power Plant Assessment

TABLE C-1
EXISTING MAINE POWER PLANTS

AQCR Name	AQCR	Plant Name	1975 Capacity MW	Fuel Type	Est. 1975 Quantity 10^3 Bbl	%S by Regulation	Allowable % S[a]	Boiler Also Designed for Coal?
Androscoggin Valley	107	Central Maine Power Co. Mason	147	oil	1662	2.5	2.2[b]	No
	107	Central Maine Power Co. Farmingdale	c					
Aroostook	108	Maine Public Service Co. Caribou	19	oil	129[d]	2.5	NA	No
Down East	109	Bangor Hydroelectric Co. E. M. Graham	57.5	oil	582[d]	2.5	NA	No
Metropolitan Portland	110	Central Maine Power Co. Cape	22.5	oil	218[d]	1.5	NA	No
	110	Central Maine Power Co. Wyman	214	oil	2442	1.5	NA	Yes
Northwest Maine	111	None						

a Determined by modeling results
b Currently operating on 2.2% S oil. Modeling results indicate an increase to 2.5% S will violate standards.
c Distillate oil gas turbine. Emergency use only.
d 1972 data from Steam Electric Plant Factors, 1973 Edition, National Coal Association, Washington, D. C.

TABLE C-2
MAINE POWER PLANT SUMMARY BY AQCR

AQCR Name		Fuel Type	1975 Fuel Required by Regulations[a] 1-2%S	>2%S	SO_2 1975 Emission Reduction Tons/Year[c]	1975 Fuel Required by Modeling[a] 1-2%S	>2%S	SO_2 1975 Emission Reduction Tons/Year[d]	TSP 1975 Emission Reduction From Existing Regulations (Tons/Year)
Androscoggin Valley	107	coal	0	0		0	0		
		oil	0	1662	-2150	0	1662	0[b]	-1457
		gas	0	0		0	0		
Aroostook	108	coal	0	0		NA	NA		
		oil	0	129	-146	NA	NA	NA	-153
		gas	0	0		NA	NA		
Down East	109	coal	0	0		NA	NA		
		oil	0	582	-424	NA	NA	NA	-465
		gas	0	0		NA	NA		
Metropolitan Portland	110	coal	0	0		NA	NA		
		oil	2660	0	6417	NA	NA	NA	-2661
		gas	0	0		NA	NA		
Northwest Maine	111	coal	0	0		0	0		
		oil	0	0	0	0	0	NA	0
		gas	0	0		0	0		

a Coal in tons/year, oil in 10^3 bbl/year, gas in 10^6cu. ft./year
b Currently operating on 2.2% S oil. Modeling results indicate an increase to 2.5% S will violate standards.
c Based on application of existing regulations.
d Based on modeling results.
NA Not available

APPENDIX D

Industrial, Commercial/Institutional Source Assessment

TABLE D-1 MAINE SIGNIFICANT SOURCES[a]

AQCR NAME	AQCR No	NEDS TSP Emissions (T/Yr)	NEDS SO_2 Emissions (T/Yr)	Reduction under existing regulations (T/Yr) TSP	SO_2	% NEDS TSP Emissions From Coal[b] (before regulations)
Androscoggin Valley	107	3331	16,716	-1129	-3042	0
Aroostook	108	335	3,065	- 281	-1572	52
Down East	109	3193	30,246	- 510	-1297	0
Metropolitan Portland	110	0	8,313	0	+2663	0
Northwest Maine	111	155	8	+ 121	0	0

a See table A-6.

b Only for significant sources not including power plants.

TABLE D-2 MAINE SIGNIFICANT INDUSTRIAL AND COMMERCIAL/INSTITUTIONAL SOURCES

AQCR Name	AQCR No.	Particulate Sources[a]		SO_2 Sources[a]	
		Plant Name	County	Plant Name	County
Androscoggin Valley[b]	107	Scott Paper Co.	Kennebec	International Paper Co. (Androscoggin Mill)	Franklin
		International Paper Co. (Androscoggin Mill)	Franklin	Oxford Paper Co.	Oxford
		Oxford Paper Co.	Oxford	International Paper Co. (Otis Mill)	Franklin
		Diamond Match	Kennebec	Statler Industries	Kennebec
		Diamond Match	Oxford	Keyes Fiber Co.	Kennebec
		Forster Mfg. Co. (Strong)	Franklin	Marine Colloids	Knox
		Statler Industries	Kennebec		
		Marine Colloids	Knox		
		Forster Mfg. Co. (East Wilton)	Franklin		
		International Paper Co. (Otis Mill)	Franklin		
		Dirigo Dowel, Inc.	Somerset		
		Stowell - MacGregor	Oxford		
		Burnham Div. of Ethan Allen	Waldo		
		Stowell Silk Spool Co.	Oxford		
Aroostook	108	Loring A.F.B.	Aroostook	Vahlsing Inc.	Aroostook
		Vahlsing Inc.	Aroostook	Loring A.F.B.	Aroostook
		Sherman Lumber Co.	Aroostook	U.S. Gypsum Co.	Androscoggin
		U.S. Gypsum Co.	Androscoggin		
Down East	109	G. Pacific Corp.	Washington	Great North - Nekoosa Paper (Millinocket)	Penobscot
		Great North - Nekoosa Paper (Millinocket)	Penobscot	Great North - Nekoosa Paper (E. Millinocket)	"
		Great North - Nekoosa Paper (E. Millinocket)	Penobscot	Ga. Pacific Corp.	Washington
		Penobscot Co.	Penobscot	Penobscot Co.	Penobscot
		Lincoln Pulp and Paper	Penobscot	St. Regis Paper	Hancock
		Forster Mfg. Co.	Penobscot	Lincoln Pulp and Paper	Penobscot
				Eastern Fine Paper Co.	Penobscot
				Eastland Woolens Co.	Penobscot
Metropolitan Portland	110	No significant points		Scott Paper	Cumberland
				Portsmouth Naval Yard	York
				Pejepscot Paper	Sagadahoc
				Pepperell	York
				Brooks Woollen Co.	York
Northwest Maine	111	J. M. Huber Corp.	Penobscot	J. M. Huber Corp.	Penobscot
		Forster Mfg. Co.	Franklin	Forster Mfg. Co.	Franklin

a Listed in descending order of emissions.

APPENDIX E

Area Source Assessment

APPENDIX E

Table E-1 presents area source fuel combustion data as contained in NEDS. In the cases where a Maine county is partially contained in two or more AQCR's, it appears that the entire county's data are listed as if the county was contained totally in the lower numbered AQCR. Since AQCR 111, Northwest Maine, is both the highest numbered AQCR in Maine and also is composed entirely of counties which are also located in other (lower numbered) AQCR's all area source data for the region appear in NEDS as zero.

TABLE E-1
MAINE AREA SOURCES[a]

AQCR Name	AQCR No.	Fuel Burned				Emissions	
		Type	Amount[b]	% S[c]	Range of % S	TSP	SO_2
Androscoggin Valley	107	Coal:					
		Anthracite	3,160	0.7	----	24	41
		Bituminous	1,000	0.6	----	28	12
		Oil:					
		Distillate	165,570	0.4	0.2-0.5	828	4086
		Residual	30,960	2.2	1.9-2.3	356	5370
		Gas:					
		Natural	1,430	---	----	13	0
		Process	0	---	----	0	0
		Wood:	36,700	---	----	459	9
						1708	9518
Aroostook	108	Coal:					
		Anthracite	960	0.7	----	6	13
		Bituminous	0	---	----	0	0
		Oil:					
		Distillate	44,530	0.3	----	223	948
		Residual	6,670	2.6	----	77	1361
		Gas:					
		Natural	380	---	----	4	0
		Process	0	---	----	0	0
		Wood:	13,500	---	----	169	3
						479	2325

AQCR Name	AQCR No.	Fuel Burned				Emissions	
		Type	Amount[b]	% S[c]	Range of % S	TSP	SO_2
Down East	109	Coal:					
		Anthracite	1,850	0.7	----	15	26
		Bituminous	0	---	----	0	0
		Oil:					
		Distillate	97,780	0.4	0.2-0.4	489	1808
		Residual	16,150	2.3	2.0-2.4	186	2949
		Gas:					
		Natural	580	---	----	5	0
		Process	0	---	----	0	0
		Wood:	29,000	---	----	362	7
						1057	4790
Metropolitan Portland	110	Coal:					
		Anthracite	4,150	0.7	----	30	54
		Bituminous	0	---	----	0	0
		Oil:					
		Distillate	145,480	0.7	0.3-0.9	727	6991
		Residual	39,400	2.1	1.8-2.2	452	6567
		Gas:					
		Natural	1,560	---	----	15	0
		Process	0	---	----	0	0
		Wood:	13,100	---	----	164	3
						1388	13615
Northwest Maine	111	Coal:					
		Anthracite	0	---	----	0	0
		Bituminous	0	---	----	0	0
		Oil:					
		Distillate	0	---	----	0	0
		Residual	0	---	----	0	0
		Gas:					
		Natural	0	---	----	0	0
		Process	0	---	----	0	0
		Wood:	0	---	----	0	0
						0	0

[a]NEDS data.

[b]Coal in tons; oil in 1000 gals.; gas in MCF; wood in tons.

[c]Average weighted sulfur content.